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A new species of *Eucosma* Hübner from the Western United States (Lepidoptera: Tortricidae: Eucosmini)

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Abstract

Eucosma aurilineana, new species, is described from five western states. The adults and male and female genitalia are illustrated, along with adults and female genitalia of two similar species, *Eucosma crambitana* and *E. ridingsana*.

Key words: *Eucosma aurilineana*, *E. crambitana*, *E. griselda*, *E. ridingsana*, Arizona, California, Nevada, Olethreutinae, Tortricidae, Utah, taxonomy, Wyoming

Introduction

In late summer several years ago, a large, gold-striped, silvery-white *Eucosma* began to appear in my patio UV light trap. Attempts to identify the species from a search of the existing literature and regional museum collections failed. Additional searching located a few specimens in the Essig Museum of Entomology (University of California, Berkeley) and in two private collections. I then concluded that the moth was undescribed, and a description is now provided.

In color and maculation the new species is similar to *Eucosma crambitana* (Wlsm.) and *E. ridingsana* (Rob.), with which it is sympatric and synchronic at the type locality. For this reason I am including photographs of the adults and female genitalia of *E. crambitana* (Figs. 2b, 6, 8b) and *E. ridingsana* (Figs. 2a, 7, 8c). The male genitalia of *crambitana* and *ridingsana* were illustrated by Heinrich (1923, figs. 213, 210 respectively). Apparently the female genitalia of *E. crambitana* have not been illustrated in the literature. Partial female genitalia (sterigma) of *E. ridingsana* were illustrated by Blanchard & Knudson (1981, figs. 8–21). Based on genitalic characters, the new species does not appear to be related to either *E. crambitana* or *E. ridingsana*, and its affiliation is uncertain.

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Blanchard & Knudson (1981) described *Eucosma griselda* from Texas, a species very similar to *E. ridingsana* in adult color and maculation, and illustrated the adults and genitalia. Knudson and Bordelon (2003, GUMO section, plate 2, fig. 4) illustrated an adult of *E. griselda* in color. The geographic distributions of the new species and *E. griselda* do not overlap, and there will be no further discussion of *griselda*.

All of the images were taken with a Fuji S1 FinePix Pro digital SLR camera. The genitalic images were taken through an Olympus SZ60 stereozoom microscope with the Fuji camera body attached to the microscope photo tube. Post processing of all of the images was done with Adobe Photoshop®.

Eucosma aurilineana **Ferris, New Species**
(Figs. 1, 3–5, 8a)

Diagnosis. This species is distinguished from the superficially similar *E. ridingsana* (Fig. 2a) by its much larger size (1.2–2X) and a forewing pattern lacking an apical transverse line while having 3-4 oblong distally located spots on the costa. The similarly sized *crambitana* (Fig. 2b) lacks costal spots and the diagonal base-to-apex gold line of *aurilineana*.

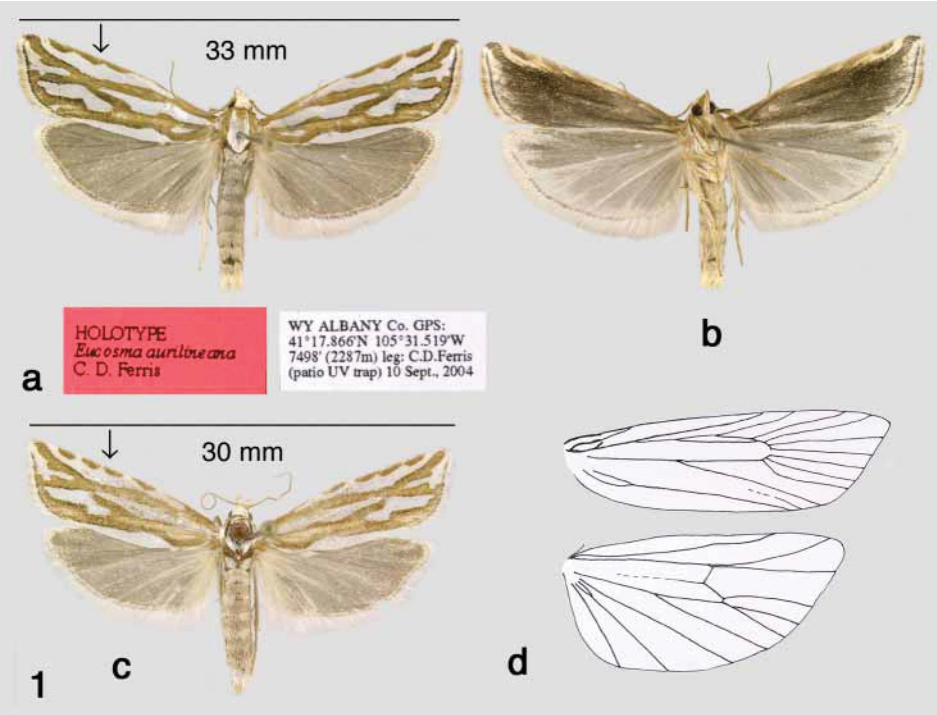

FIGURE 1. *Eucosma aurilineana*. a, male holotype with pin labels, WYOMING, Albany Co.; b, holotype, V; c, female paratype, Wyoming, Albany Co.; d, wing venation; arrows point to costal margin spots.

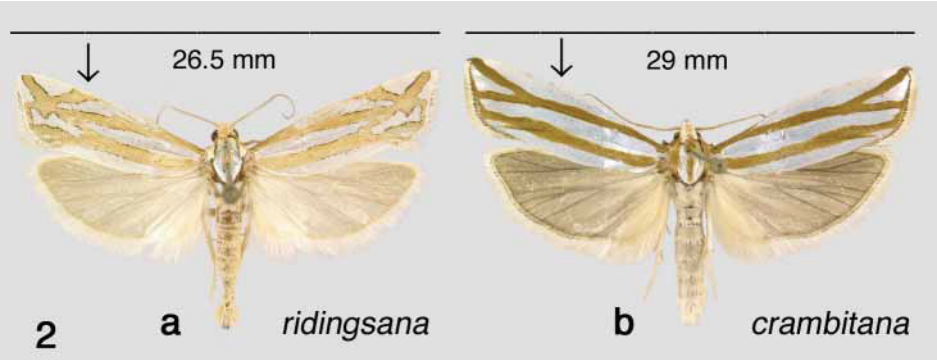

FIGURE 2. *Eucosma* species from WYOMING, Albany Co. a, *E. ridingsana*, a large specimen (arrow denotes diagonal band at intersection with costal margin): b, *E. crambitana* (arrow denotes absence of marginal spots).

Description. MALES (Figs. 1a, b). *Head:* Frons and vertex white with small indistinct patch of golden tan scales anterior of each antennal base; length of labial palpus 2X diameter of eye, white dorsally with golden-tan scales laterally and at tip. Antenna weakly bipectinate, golden tan. Ocellus and chaetosema present. *Thorax:* Dorsum white with mid-dorsum patch of golden tan scales, patagia and tegulae golden tan. Legs dorsally clothed with golden tan scales and ventrally with creamy white scales. *Abdomen:* Clothed with whitish scales with occasional light tan dusting, dense longitudinal white scaling of 8th abdominal segment forming an anal tuft. *Forewing:* Length, measured along costa from base to apex, 13.0–17.5 mm (holotype 17.0 mm), mean = 15.9 mm (n = 75); costal fold extending approximately 0.35 forewing length; dorsal ground color lustrous white, with over lying lattice pattern of golden tan (the color of old gold) broad lines and spots, consisting of two longitudinal stripes extending from base to outer margin with lower line rather irregular, upcurved at tornus then tapering toward apex along terminal margin; a diagonal line extending from base below lower longitudinal line across both longitudinal lines to apex, costa with three, small, oblong spots (sometimes conjoined) between apex and mid-wing, terminal line very thin, dark; fringe lustrous white with just a suggestion of golden tan at scale tips; ventrally brownish fuscous with repetition of costal spots, pale submarginal band, and thin brownish terminal line, fringe scales white with brownish tips (darker than above). *Hindwing:* Lustrous pale fuscous; fringe with two layers of scales, a lustrous white layer of long scales and an overlying basal layer of short faintly colored golden tan scales; venter fuscous fading to white along margins; wing venation as shown in Fig. 1d. **Genitalia** (Fig. 3a) [4 specimens dissected from Wyoming and California]: Socii well developed and densely setose; valva flat, slightly setose basad; cucullus with corona-bearing stout spines; aedoeagus with a central slender cornutus tapering toward tip and 2-3 sockets indicating shed cornuti.

FEMALES (Fig. 1c). External morphology as in males, but antenna less pubescent. *Forewing*: Length 13.0–15.5mm, mean = 14.5 mm (n = 7), costal fold absent; costa with 3

or 4 spots with basal spot sometimes weakly connected to upper longitudinal line; abdominal anal tuft absent. **Genitalia** (Figs. 3b–e, 8a): Ovipositor lobes densely setose, very few setae arising from small papillose bases; posterior apophyses ca 0.55 length of anterior apophysis; ostium bursae constricted at base of lamella postvaginalis, expanding with ductus bursae; ductus seminalis with bursa seminalis; corpus bursae ellipsoidal; anterior signum thorn-like, larger posterior signum an open cone with rounded apex (3 specimens dissected from California, Nevada, Wyoming).

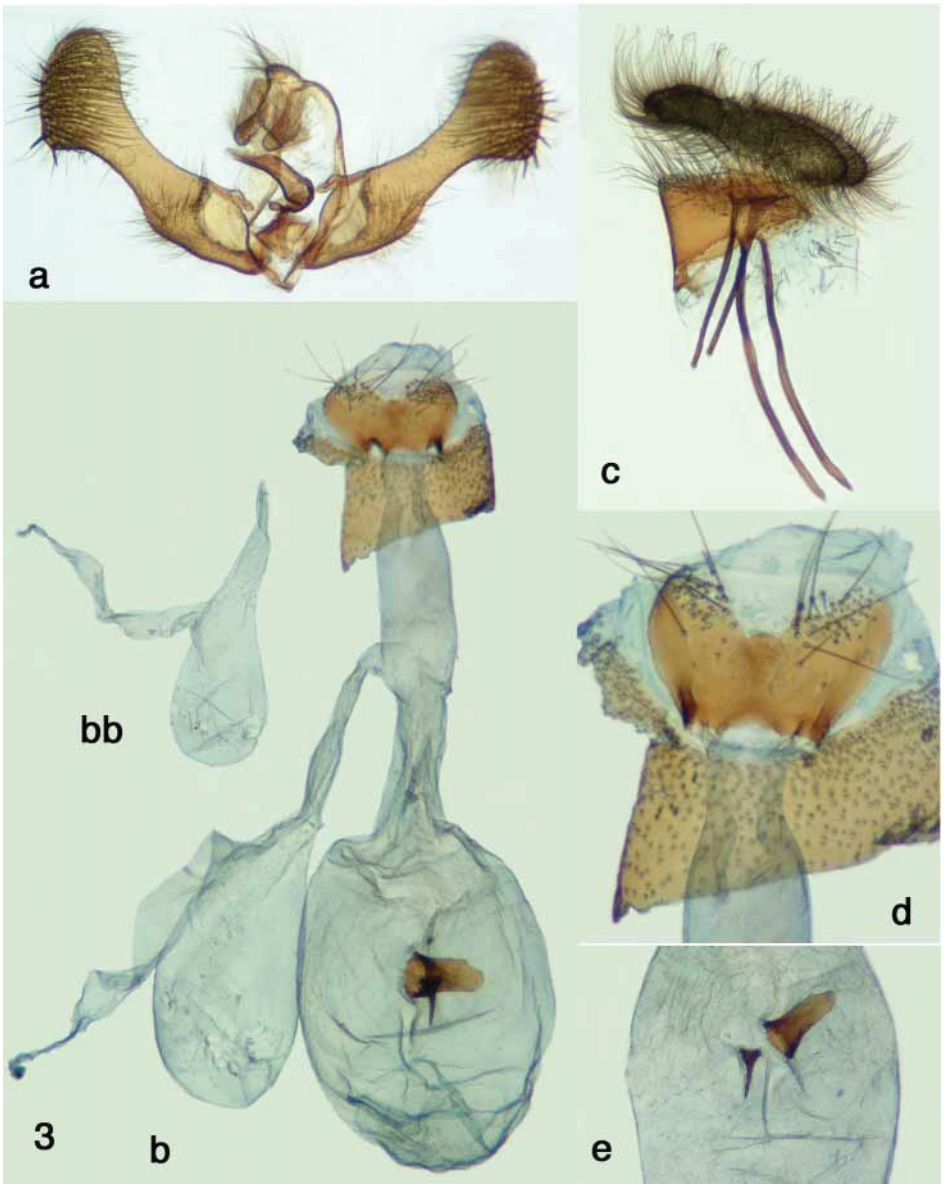

FIGURE 3. *Eucosma aurilineana* genitalia. a, male; female (b–e), b, corpus bursae; bb, ductus seminalis and bursa seminalis; c, ovipositor lobes and apophyses; d, lamella postvaginalis and ostium bursae; e, signa.

Holotype: male: **WYOMING**, Albany Co., 41°17.886'N, 105°31.519'W, 2285 m, ca. 1.6 km SE of Laramie, 10.ix.2004, to be deposited in NMNH.

Paratypes: 77♂, 5♀. **CALIFORNIA**, Mono Co., dunes NE of Mono Lake, 23.ix.1995, R. Robertson (1♂), Tom's Place, larva vii.9.1968, eclosed viii.28.1968, J. A. Powell No. 68G11 (1♀). **NEVADA**, Humboldt Co., dunes 9.7 mi. NW of Winnemucca, 1495 m, 9-28-64 (28.ix.1964), C. Henne (2♀). **WYOMING**, Albany Co., 41°17.886'N, 105°31.519W, 2285 m (all C. D. Ferris), 1.ix.2001 (1♂), 30.viii–2.ix.2002 (10♂), 15.ix.2003 (1♂); 1.ix.2004 (2♂), 6–11.ix.2004 (45♂, 2♀), 13.ix.2004 (3♂), 17–18.ix.2004 (2♂); 41°17.820'N, 105°31.334'W, 2289 m (all J. S. Nordin), 27.viii.1990 (1♂), 3.ix.1992 (1♂), 11.ix.1993 (1♂), 29–31.viii.1996 (2♂), 31.viii.04 (1♂), 1.ix.2004 (2♂), 7–10.ix.2004 (3♂), 18.ix.2004 (1♂).

Additional specimens examined: 7♂, 2♀. **ARIZONA**, Mohave Co., Rosy Canyon Rd., 0.6 mi. S. Utah line, 22.ix.2000, G. J. Balogh (1♂). **UTAH**, Uintah Co., 3 mi. N. of Vernalon [Rd.], 2500 W, 1886 m, 4.ix.2000, D. J. Wright (5♂, 2♀). **WYOMING**, Albany Co., 41°17.820'N, 105°31.334'W, 2289 m, 30.viii.2002, J. S. Nordin (1♂).

Paratypes are currently placed in the collections of the author, J. S. Nordin (Laramie, WY), Essig Museum of Entomology, University of California, Berkeley, CA, University of Wyoming Insect Collection, Laramie, WY, and C. P. Gillette Museum of Arthropods Diversity, Colorado State University, Fort Collins, CO.

Etymology. The specific epithet *aurilineana* is derived from a combination of the Latin words for gold and line, reflecting the maculation of this moth.

Biology. An adult female was reared by J. A. Powell from a larva found boring in roots of *Ericameria viscidiflora* (Hooker) L. C. Anderson (Asteraceae) in Mono Co., CA. This plant does not occur at the type locality, but there is a concentration of the related *Gutierrezia sarothrae* (Pursh) Britton & Rusby (Asteraceae) that may serve as the larval host. *Ericameria viscidiflora* does occur some kilometers distant in the same county. The type locality (Fig. 4) is sagebrush-steppe high plains in which the principal vegetation is grasses and forbs with the woody shrubs *Gutierrezia sarothrae* and two species of *Artemisia*.

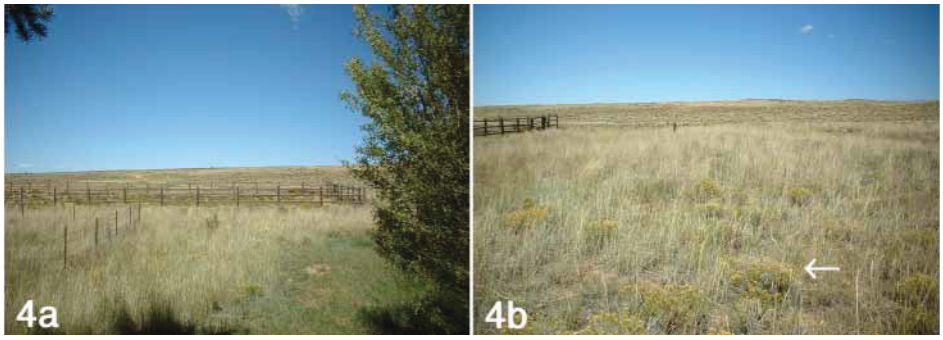

FIGURE 4. Two views of type locality on 8 September 2004 during the flight period. a, area illuminated by UV light trap placed on author's patio; b, area illuminated by trap placed 15 m to the east, white arrow points to a clump of *Gutierrezia sarothrae*.

Flight period. Based upon specimens examined, adults fly from 27 August to 23 September, depending upon locality and annual weather conditions.

Distribution. This species is presently known from sites in five western states as indicated by the solid circles in Fig. 5, but the vast majority of the specimens are from the type locality.

FIGURE 5. Distribution of *Eucosma aurilineana*: ARIZONA, Mohave Co.; CALIFORNIA, Mono Co.; NEVADA, Humboldt Co.; UTAH, Uintah Co.; WYOMING, Albany Co.

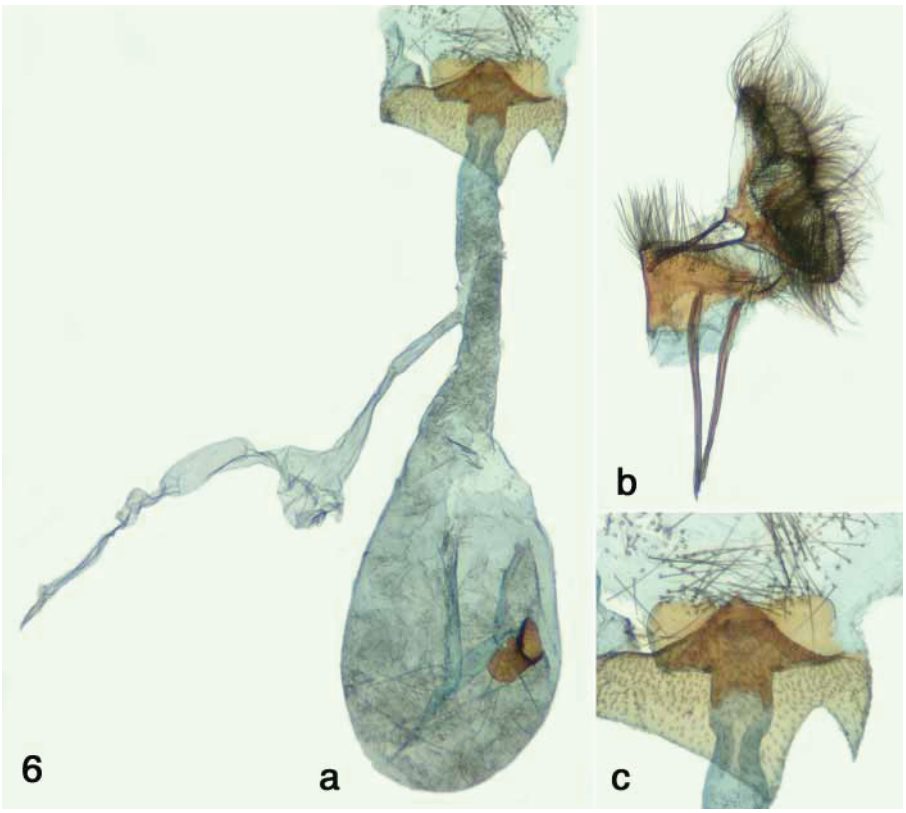

FIGURE 6. *Eucosma crambitana* female genitalia. a, corpus bursae; b, ovipositor lobes and apophyses; c, lamella post vaginalis and ostium bursae.

Variation. There is little variation other than forewing length and number of costal margin spots, as noted in the description. The color intensity varies to some degree with a few specimens being very pale.

Female genitalia of *Eucosma crambitana* (Figs. 6a–c, 8b)**:** Ovipositor lobes strongly setose, setae arising from small papillose bases; posterior apophyses ca. 0.43 length of anterior apophyses; ostium bursae constricted at base of lamella postvaginalis, expanding slightly with ductus bursae; ductus seminalis with small bursa seminalis; corpus bursae ellipsoidal; one thimble-like signum (1 specimen dissected from Albany Co., Wyoming).

Female genitalia of *Eucosma ridingsana* (Figs.7a–c, 8c)**:** Ovipositor lobes moderately setose, setae arising from small papillose bases; posterior apophyses ca. 0.46 length of anterior apophyses; ostium bursae constricted at base of lamella postvaginalis, expanding with ductus bursae; ductus seminalis with large bursa seminalis; corpus bursae nearly spherical; two conical thorn-like signa (1 specimen dissected from Albany Co., Wyoming).

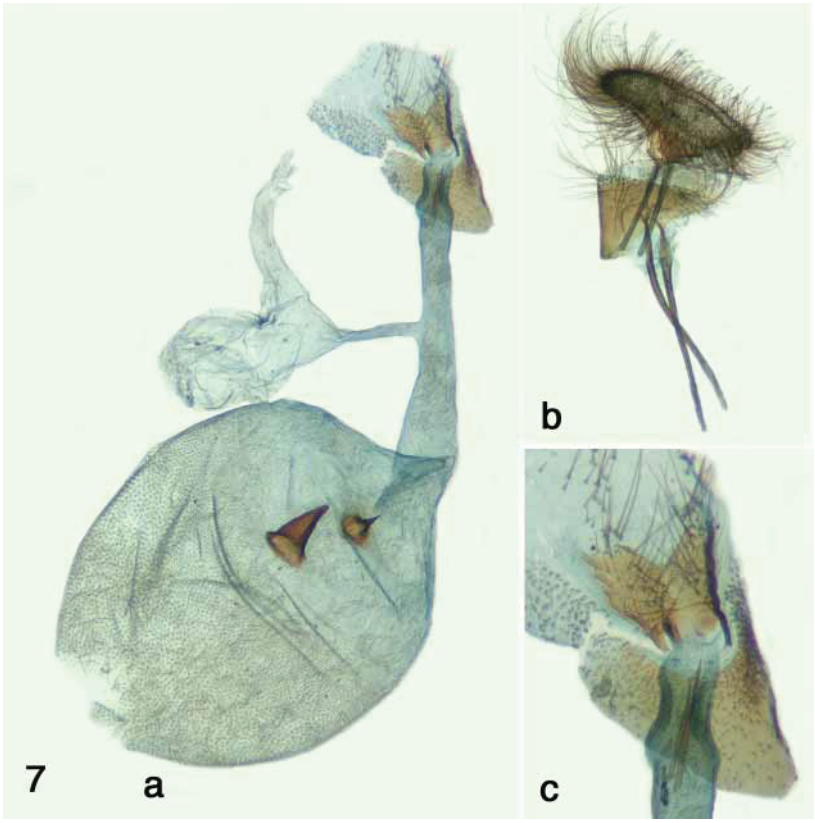

FIGURE 7. *Eucosma ridingsana* female genitalia. a, corpus bursae; b, ovipositor lobes and apophyses; c, lamella postvaginalis and ostium bursae.

Comparison of sterigma: Fig. 8 illustrates the sterigma of *E. aurilineana*, *E. crambitana*, and *E. ridingsana*.

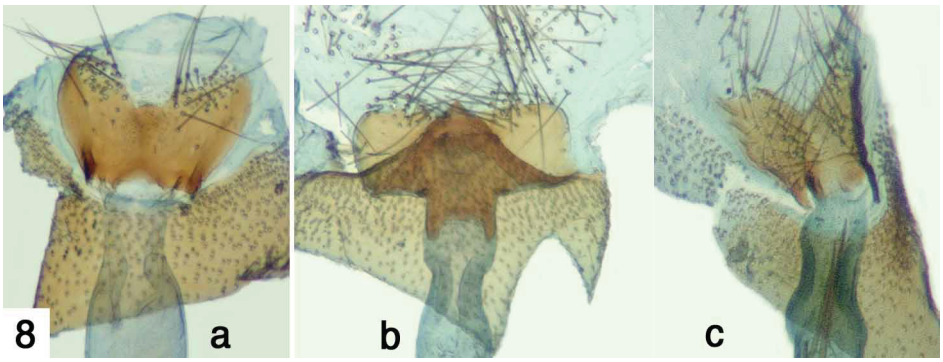

FIGURE 8. Comparison of the sterigma in three *Eucosma* species. a, *E. aurilineana*; b, *E. crambitana*; c, *E. ridingsana*.

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